

3. It puts the custody of the unclaimed dead in the State Board of Health.

4. It makes it mandatory to notify the State Board of Health of the possession of the body of the indigent dead.

5. It forbids autopsies on such bodies without consent of the state board or its representative or representatives.

6. It makes it lawful to obtain fresh human tissue for microscopic investigation at time of a coroner's autopsy.

7. It imposes the expense of burial upon relatives or friends who may claim the dead.

8. It makes noncompliance with its provisions a misdemeanor.

Experience with the administration of the Act of 1927 confirmed the surmises of those especially concerned in the formulation of the bill. Hence an amendment was formulated in 1929 through Dean Millberry, the representative of the State Board of Health for Northern Institutions, and with the coöperation of that board, providing that the bodies of all unclaimed dead shall come directly into the custody of educational institutions *at the place of death* and stipulating that "No other acts or parts of acts shall be construed as limiting the powers of the State Department of Public Health in the transportation or distribution of the indigent dead for educational purposes."

Since a single county with a population of only about 100,000 now buries more bodies annually at the expense of the taxpayers than are required by all the educational institutions of the state, it is evident that there is no dearth of the unclaimed dead. And since the people of California have, through their representatives in the legislature, repeatedly reaffirmed their wise decision to permit the use of the bodies of the unclaimed dead for educational and scientific purposes, no one should be permitted to stand in the way of the present law, for I do not believe that our people will become so benighted as to forbid the use of the dead for the instruction and help of the living. That would be more than suicidal, for the innocent also would suffer in consequence.

It is interesting that similar difficulties and experiences still are encountered in Scotland, where the Anatomy Act merely is permissive. As late as 1921 Professor Robinson wrote:

"It is well known that the number of unclaimed bodies buried in the United Kingdom every year at the public expense is sufficient to supply all the medical schools with the material necessary for the training of surgeons and physicians, yet there are few, if any, schools which receive an adequate supply, and the majority never have anything like a sufficient supply.

"That the supply known to exist is not available for the purpose for which it is essential is because, in many cases, members of the authorities to whom the legal control has been deputed give sentimental considerations more weight than considerations of the public welfare, and take means to evade the spirit of the Anatomy Act.

"It is to be noted that only the bodies of those who have no relatives are placed by the Act at the disposal of the state, and surely no one in authority has any justification, in such circumstances, to placate sentiment at the expense of the public good.

"The bodies which are sent to the medical schools suffer no disrespect; everything which is done to them is done under the control and inspection of H. M. Inspectors of Anatomy up to the time of the burial of the bodies in consecrated ground."

#### COMMENT

It is a great satisfaction to recall that it has not been the people at large who have been responsible for the difficulties connected with obtaining the bodies of the unclaimed dead, but only a few financially interested individuals who have relied for protection against exposure upon the possibility of taking advantage of public ignorance, sentiment, and belief. If these persons had to live without all the beneficent things that they owe to medicine and also had to go without the care of physicians, they would have a rude awakening and would meet with more condign punishment than any that could be imposed by law. Moreover, if the people were told the real facts, the few who use the unclaimed dead for profit would stand forth in their true character and could no longer disgrace their fellows.

The institutions which need the dead and are entitled to them by law always have paid undertakers considerably more for the *delivery of an unembalmed body* merely covered with a sheet than generally was allowed for the burial of them by municipalities or counties. Even a pauper's burial necessitates calling for the body, putting it in a black redwood coffin, digging the grave, interring the body and providing a plain board (numbered for identification), and keeping and filing the record, while all that is asked by educational institutions is the delivery of the naked body to them, the recognized claimants under the law.

Stanford University.

#### FRACTURE OF THE NECK OF THE FEMUR\*

##### END RESULTS IN EIGHTY-SIX CASES

By JOHN C. WILSON, M. D.

Los Angeles

DISCUSSION by George C. Hensel, M. D., San Francisco;  
John Hunt Shephard, M. D., San Jose.

CAREFUL end-result studies of fractures of the neck of the femur do not occupy a significant position in medical literature. It will be impossible to speak with authority on the merits of the different forms of treatment until more carefully selected data are available.

Much has been written about the treatment of hip fractures. The unfavorable results have caused wide differences of opinion as to the best plan of securing a cure. There appears to be a great variety of results with the accepted forms of treatment in the hands of competent surgeons. It is hoped that the report of the following cases may shed a ray of light on this problem.

\* Read before the General Surgery Section of the California Medical Association at the fifty-eighth annual session at Coronado, May 6-9, 1929.

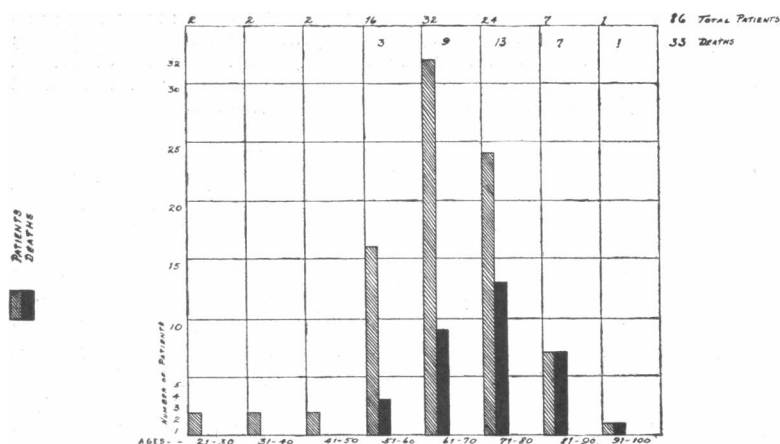


Chart 1.—Graphic illustration of mortality with respect to age of patients.

#### CLASSIFICATION

In describing hip-joint fractures the terms "intracapsular," "extracapsular," "medial," and "lateral" are frequently used in medical literature, but these terms only add to the disorder because extracapsular or lateral fractures are not fractures of the femoral neck. The neck of the femur is an entity, and much confusion will be avoided if fractures are described according to their true anatomic confines. Fractures of the neck of the femur and those of the intertrochanteric region are not comparable. Intertrochanteric fractures should cause no concern, while the same cannot be said of fractures of the neck of the femur.

The term "impacted fracture" is ambiguous. It should be used only when its meaning is clearly understood. Locking of the fragments may be sufficiently secure to permit weight-bearing, but is in no sense an impaction. A careful study of stereoscopic roentgenograms will demonstrate a complete absence of contact between the fractured surfaces; on the other hand, the x-ray may show a break in continuity of the neck with a little shortening of the leg and a mild coxa vara.

#### TREATMENT

Treatment should be directed toward a reduction of the fracture which implies an anatomic restoration of the fragments until healing has taken place, or until it is demonstrated that bony or fibrous union is hopeless.

Some forms of treatment rely upon traction and countertraction to maintain reduction of the

fragments. The methods of Bardenhauer, Maxwell, and Ruth are the most familiar. Traction is not a practical way of maintaining reduction because it requires special apparatus and constantly trained supervision. The Whitman method is mechanically sound and allows the patient to be moved about in bed without the danger of disarranging the fragments. Whitman considers his treatment suitable for all patients irrespective of age, but there are surely some exceptions to this rule, for some of the aged will not tolerate any sort of a surgical procedure.

In briefly discussing Whitman's treatment it is well to remember that complete anesthesia is not always necessary for reduction of the fracture. Scopolamin and morphin in small doses will produce narcosis which permits painless reduction and cast application. The patient is placed on a plaster table or sacral rest and the fractured leg is gently manipulated, gradually internally rotating and abducting the thigh. Complete abduction may cause downward displacement of the distal fragment (Figure 1). About ten degrees less than complete abduction is probably the best position. The spica plaster should include the toes on the affected side and extend to the knee on the opposite side. The patient will be most comfortable if placed on a firm bed, preferably one with boards under the mattress.

Stereoscopic x-ray control is essential to check the accuracy of the reduction. If the picture reveals a situation as shown in Figure 1, the operation must be repeated until the fragments appear as in Figure 2. Patients should be kept in the plaster cast for at least three months, preferably four months. If union is not sufficient in four months to maintain apposition of the fragments without weight-bearing, it probably will not occur with further prolongation of fixation. Demineralization of bones takes place after prolonged splinting. This is especially true in elderly persons.

A number of mechanical joints have been advocated to preserve movement in the knee joint by

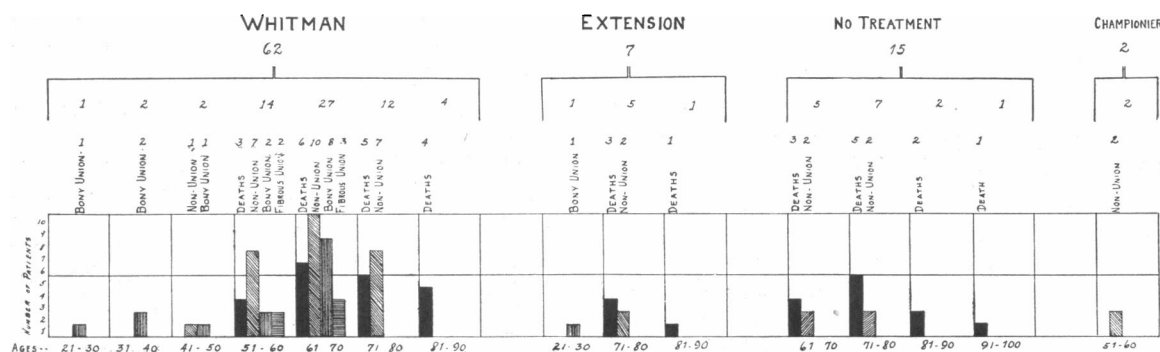


Chart 2.—Graphic illustration of age of patients, manner of treatment, and results.



Fig. 1.—Downward displacement of distal fragment because thigh has been abducted too far.

Fig. 2.—Good reduction.

making a hinge in the plaster cast. The lack of adoption seems to indicate their impracticability.

#### CAUSES OF FAILURE

Failure may be attributed to imperfect reduction, insufficient fixation, interposition of soft tissues, or lack of blood supply about the point of fracture. The surgeon has no control over the blood supply, but he can obtain and maintain a reduction. He also has a reasonable opportunity to prevent the interposition of soft tissues.

Eighty-six consecutive fractures of the neck of the femur from the orthopedic service of the Los Angeles General Hospital, all seen during a period of four years are offered for your consideration. Thirty-three of these patients are dead, twenty-eight having died in the hospital, and five after having been discharged from the hospital. Fourteen patients died from cardiovascular disease and nephritis; eight died from bronchopneumonia. Fibrinous pericarditis, lung abscess, cirrhosis of the liver and pyelonephritis each accounted for one death.

Three patients died suddenly after reduction of fractures. These deaths were attributed to coronary occlusion or pulmonary embolus. One patient died as a result of a ruptured bladder, due to the injury. The cause of death was not recorded in three cases.

Two patients had fractures between the ages of twenty-one and thirty, two between thirty-one and forty, and two between forty-one and fifty; with no deaths. There were sixteen patients between the ages of fifty-one and sixty; with three deaths. The period of sixty-one to seventy years included thirty patients; with nine deaths. The period of eighty-one to ninety years included seven patients; with seven deaths. The period of ninety-one to one hundred years included only one patient; with one death.

Sixty-two patients were treated by the Whitman method, seven by extension, three by the Championier method, and fifteen received no treatment. Of the sixty-two patients treated by the Whitman method, eight died during the treatment. The one patient between the ages of twenty-one and thirty (Figures 3 and 4) recovered with bony union; two patients between thirty-one and forty healed by bony union; and of the two patients between forty-one and fifty, one healed by bony union and one resulted in nonunion.

The percentage of nonunion increases with advancing years. Between fifty-one and sixty there were seven patients with nonunion, two with fibrous union, and two in whom there was no healing. The sixth decade includes ten patients who failed to obtain healing; three patients who received fibrous union (Figures 5 and 6) and eight patients who had healing with bony union. Not one of the seven surviving patients between seventy-one and eighty showed any signs of repair.

#### EXTENSION TREATMENT

Of the three surviving patients treated by extension, one healed by bony union. This was an accidental fracture which occurred during the manipulation of an arthritic hip.

#### NO TREATMENT

The patients classified under the heading of no treatment refused to submit to the measures recommended, or were too feeble for surgical interference. Only two of the fifteen patients survived the period of hospitalization and terminated in nonunion.

#### CHAMPIONIER METHOD

Two patients were treated by the method of Championier, mobilization and massage, and both were failures.



Fig. 3.—Complete unreduced central fracture of the neck of the femur in female aged thirty-seven.

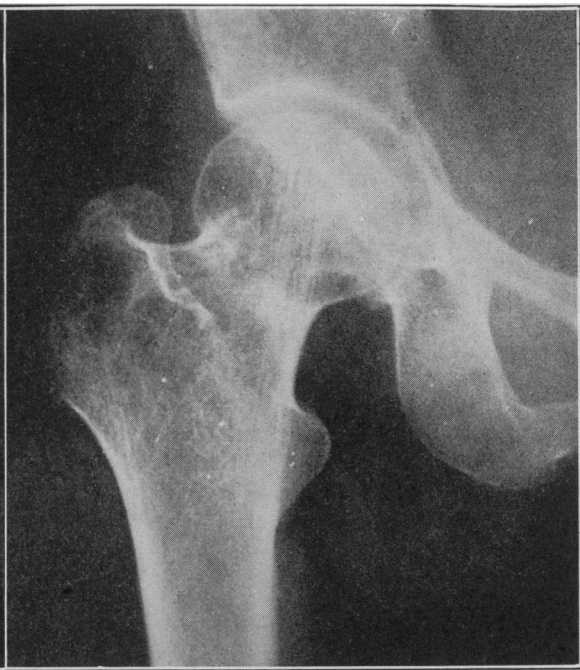


Fig. 4.—Same as Fig. 3, three years and five months later. Healed in good position. Note the normal trabeculation across the line of fracture.

#### CONCLUSIONS

This series of cases demonstrates that fractures of the hip are not due to severe violence. A large proportion of these fractures were due to injuries occurring in homes of the patients, such as tripping over rugs, or slipping from steps.

The mortality from hip fractures is relatively high. This is, of course, partly due to the fact that these injuries belong to the latter decades of life. The fractures often serve to precipitate fatal

crises in persons suffering from cardiovascular diseases, and result in death during the first week subsequent to the injury. Pneumonia is a common fatal complication.

Incomplete fractures of the femoral neck should not be broken up by manipulation, as they seem to heal at any age if properly splinted (Figures 7 and 8).

Fibrous union of a fracture of the neck of the femur allows only a fair return of function.

1136 West Sixth Street.

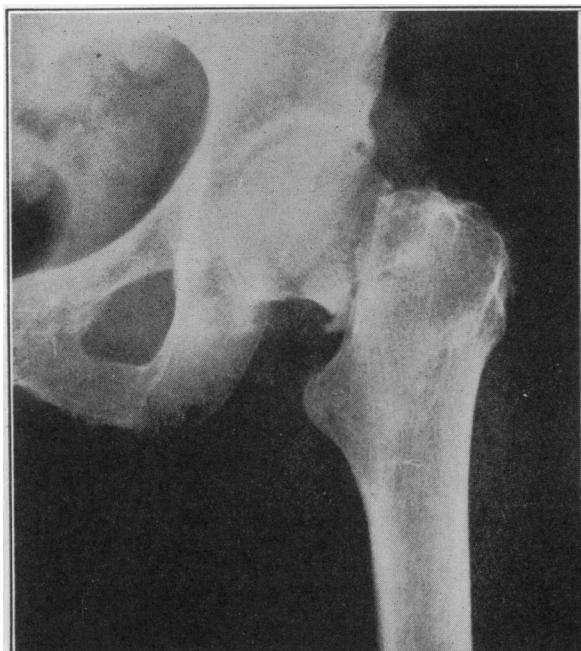


Fig. 5.—Complete fracture of neck of the femur in female aged sixty-seven.

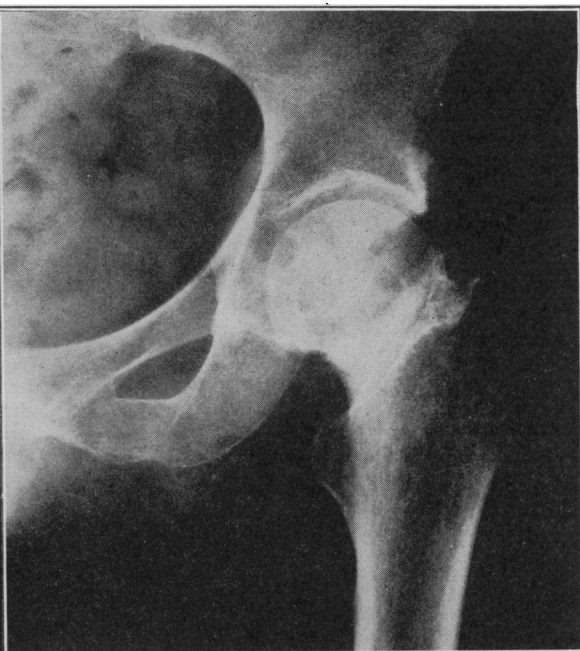


Fig. 6.—Same as Fig. 5, two years later. Note cystic appearance of femoral head with marked eburnation at the fracture line and absence of trabeculation.

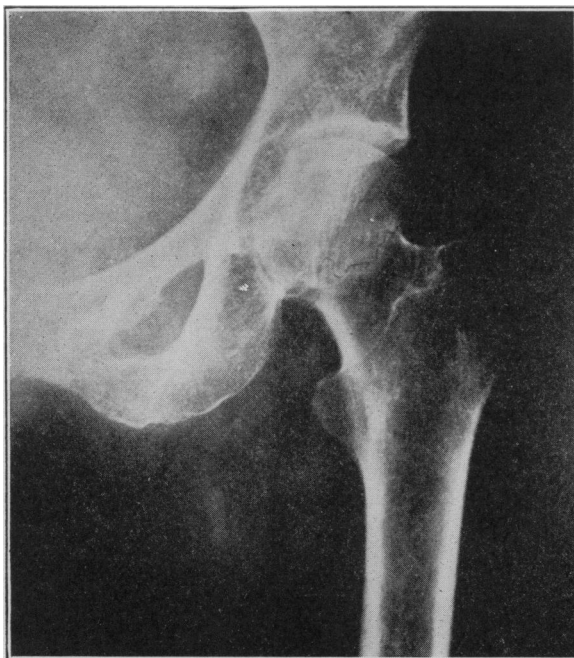


Fig. 7.—Incomplete fracture of the neck of the femur in female aged sixty-five.



Fig. 8.—Same as Fig. 7, one year following injury. Complete recovery without disability.

#### DISCUSSION

GEORGE C. HENSEL, M. D. (384 Post Street, San Francisco).—This survey of results in eighty-six fractures of the femoral neck, while largely statistical, seems to favor the Whitman procedure as meeting a larger number of requirements than surgical repair, traction, or other manipulative technique.

This in my experience is quite true, yet under favored conditions, particularly those of age, physique of patients, and individual mechanical features of a given cervical fracture, I should not hesitate to recommend surgical repair or artificial impaction.

There can be no doubt that in skilled hands the latter procedures offer no greater chance of nonunion or objectionable fibrous union and do offer, I believe, a somewhat greater possibility of bony union.

The answer to this situation must surely be based on judgment and personal skill rather than general adoption of any one method.

Where the question of contact of fragments occurs, Doctor Wilson points out the need of stereoscopic roentgenograms. I would suggest that the use of Hickey's maneuver in the anterior posterior projections, *i. e.*, with the thigh adducted and then abducted, is even more certain in clearing this point.

In using the Whitman position, full abduction will more often give good bony contact and position than partial abduction. A full measure of internal rotation is similarly desirable. Full extension of the thigh offers valuable splinting action through the anterior capsular ligaments of the hip which are tense in this position. There are objections to full extension in older patients, of course, and when an early sitting posture is urgent, comfortable flexion at the hip may not greatly lessen favorable position when proper abduction and internal rotation has been secured.

Doctor Wilson's statistics are quite frank; any similar series will give parallel figures. The keynote of success in this fracture is to secure and maintain good bony contact of the fragments.

Manipulative procedure and plaster encasement does not seem universally to effect this end. It therefore becomes advisable in certain instances of fractured neck of the femur to employ forceful impaction or operative fixation, granting, of course, that these more serious procedures are not contraindicated by the physical condition of the individual.

The use of pseudo-arthritis or reconstructive procedures are individual problems and substitutes for bony union in functional position.

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JOHN HUNT SHEPARD, M. D. (608 Medico-Dental Building, San Jose).—It is pleasing to listen to a paper which is divested of all sham, camouflage, and alibis. Doctor Wilson has presented actual results in a relatively large series, and if any of us think that our results are better it is because we have had younger and more healthy patients, or have forgotten some of our failures.

I believe that if one becomes thoroughly familiar with the principles and technique laid down by Whitman in the treatment of fracture of the anatomical neck of the femur, he will rarely find occasion to use any other method. It gives the highest percentage of useful hips, is the most comfortable to the patient, and greatly facilitates nursing care.

In order successfully to carry out this method, one must have an operating table with which sufficient traction, internal rotation and abduction can be secured and maintained while the cast is being applied. The attempted application of the Whitman technique without the aid of a proper table has caused many men to turn to other methods, and when unsatisfactory results are obtained to excuse themselves because unsatisfactory results are common with all methods.

If the patient's bed is fitted with a Bradford and Balkan frame with a windlass attached, the patient can be tilted from side to side and the head raised thirty or forty degrees, which adds greatly to his comfort and may occasionally prevent a postural pneumonia.

I have been interested in preventing the stiffness of the knee joint in these patients whom we sentence to three or four months in plaster. Why does an immobilized joint stiffen? What are the tissue changes in and about the joint immobilized for three or four months? As yet, these two questions have not been answered by autopsy or experimental study.

This stiffening of the knee joint, which is a great objection to the long spica, can be largely prevented by the introduction into the plaster cast of a proper knee joint hinge, permitting daily movement of the knee joint without disturbing the fixation of the fragments. It is interesting to note how little daily movement will prevent joint stiffness.